CLAIMS

What is claimed is:

1. A method for isolating a component of a chemical mixture, comprising:

(a) identifying an analytical retention time and corresponding analytical chromatographic parameters for the component;

(b) based on the analytical retention time and the corresponding analytical chromatographic parameters, determining preparative chromatographic parameters to isolate the component at an accelerated retention time using a preparative column;

(c) eluting the chemical mixture through the preparative column using the preparative chromatographic parameters; and

(d) isolating the component at the accelerated retention time.

2. The method of claim 1, further comprising pre-selecting the accelerated retention time in step (b).

3. The method of claim 1, wherein the accelerated retention time in step (b) is associated with a reduced retention volume for the component.

4. The method of claim 1, further comprising determining the analytical retention time in step (a) by eluting the component through an analytical column using the analytical chromatographic parameters.

5. The method of claim 1, wherein eluting the chemical mixture in step (c) comprises:

(i) varying a composition associated with a mobile phase for a gradient time interval; and

(ii) injecting the mobile phase into the preparative column.

6. The method of claim 5, wherein varying the composition associated with the mobile phase comprises varying a polarity of the mobile phase in a linear gradient for the gradient time interval.

7. The method of claim 6, wherein the analytical chromatographic parameters in step (a) include a gradient steepness parameter, and wherein determining the preparative chromatographic parameters in step (b) comprises determining the preparative chromatographic parameters while holding the gradient steepness parameter constant.

8. The method of claim 5, wherein determining the preparative chromatographic parameters in step (b) comprises determining an initial composition associated with the mobile phase.

9. The method of claim 5, wherein determining the preparative chromatographic parameters in step (b) comprises determining a final composition associated with the mobile phase.

10. The method of claim 5, wherein determining the preparative chromatographic parameters in step (b) comprises determining the gradient time interval.

11. A gradient elution chromatography method, comprising:

(a) identifying at least one component in a chemical mixture;

(b) identifying a first set of gradient elution parameters to elute the component through a first column at a first elution time;

(c) using the first set of gradient elution parameters, determining a second set of gradient elution parameters to elute the component through a second column at a second elution time; and

(d) eluting the chemical mixture through the second column using the second set of gradient elution parameters.

12. The gradient elution chromatography method of claim 11, further comprising collecting the component within a time interval that includes the second elution time.

13. The gradient elution chromatography method of claim 11, wherein the first set of gradient elution parameters and the second set of gradient elution parameters include the same gradient steepness parameter.

14. The gradient elution chromatography method of claim 11, wherein determining the second set of gradient elution parameters in step (c) comprises adjusting an initial composition of a mobile phase to elute the component through the second column at the second elution time.

15. The gradient elution chromatography method of claim 11, wherein determining the second set of gradient elution parameters in step (c) comprises adjusting a gradient time interval during which a mobile phase composition is varied to elute the component through the second column at the second elution time.

16. The gradient elution chromatography method of claim 11, wherein additional components are identified in step (a), step (d) comprises eluting a portion of the chemical

mixture, and steps (b)-(d) are repeated for each additional component using a remainder portion of the chemical mixture.

17. A method to separate a component of a chemical mixture, comprising:

(a) identifying the component by eluting a first portion of the chemical mixture through a first column using a first set of gradient elution parameters;

(b) identifying a first retention time for the component associated with the first column and the first set of gradient elution parameters;

(c) using the first retention time and the first set of gradient elution parameters, determining a second set of gradient elution parameters to elute the component through a second column at a second retention time; and

(d) separating the component by eluting a second portion of the chemical mixture through the second column using the second set of gradient elution parameters.

18. The method of claim 17, wherein the first column is an analytical column, and wherein the second column is a preparative column.

19. The method of claim 17, wherein the first column and the second column comprise the same stationary phase.

20. The method of claim 17, wherein determining the second set of gradient elution parameters in step (c) comprises determining an initial polarity associated with a mobile phase that is injected into the second column.

21. The method of claim 17, wherein the first set of gradient elution parameters and the second set of gradient elution parameters are characterized by the same gradient steepness parameter.